DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by **Umemoto et al. (US 5,982,171)**.

As to claim 1, **Umemoto et al.** discloses in Figures 1-5c an arrangement comprising a magnetic-field-dependent angle sensor (11) which is effectively connected to a magnetic transmitter (2) which is arranged such that it can rotate (by shaft 1) with respect to the angle sensor (11), characterized in that the angle sensor (11) consists of at least one magnetoelectric converter (Wheatstone bridge circuit), the electrical properties of which are dependent on the magnetic field strength but independent of the polarity of the magnetic field acting on the at least one converter, and in that the magnetic field strength is selected such that the at least one converter is controlled in saturation (see Col. 9 lns 32-59).

As to claim 2, **Umemoto et al.** discloses in Figures 1-5c characterized in that the at least one converter is a magnetoresistive element (10A-10D resistors in Wheatstone bridge circuit).

As to claim 3, **Umemoto et al.** discloses in Figures 1-5c characterized in that the angle sensor is formed by at least one bridge circuit (Wheatstone bridge circuit) which consists of four geometrically arranged magnetoelectric converters (10A-10D resistors).

As to claim 4, **Umemoto et al.** discloses in Figures 1-5c characterized in that the converters (10A-10D resistors) are arranged in a circular manner (see Figure 3).

As to claim 6, **Umemoto et al.** discloses in Figures 1-5c characterized in that the output signal (at 15) of the at least one bridge circuit (Wheatstone bridge circuit) is converted into a binary signal ("0" or "1", see Col. 10 lns 6-14).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Umemoto et al. (US 5,982,171)** in view of **Doescher (US 2003/0128031).**

As to claim 5, **Umemoto et al.** discloses everything as claimed above in claim 1.

Umemoto et al. fail to teach in that at least one further bridge circuit is provided, the converters of which are arranged in a manner such that they alternate with the converters of the at least one bridge circuit, in the movement direction of the magnet .

However, **Doescher** discloses in Figure 7 that at least one further bridge circuit is provided, the converters (21,23,25,27) of which are arranged in a manner such that they

alternate with the converters (22,24,26,28) of the at least one bridge circuit, in the movement direction of the magnet.

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify **Umemoto et al.** teachings by having at least one further bridge circuit where converters are alternate with the other converters as taught as **Doescher** in order to accomplish further reduction in the hysteresis and to improve the linearity.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Umemoto et al. (US 5,982,171)** in view of **Spellman (US 6,448,763).**

As to claim 7, **Umemoto et al.** discloses everything as claimed above in claim 1.

Umemoto et al. fail to teach in that the output signals of at least two bridge circuits are converted into a signal that changes linearly with the movement of the magnet, by applying an inverse trigonometric function.

However, **Spellman** discloses in Figures 4 and 5 in that the output signals of at least two bridge circuits (78 and 80) are converted into a signal that changes linearly with the movement of the magnet, by applying an inverse trigonometric function (sin,cos,arctangent, see Col. 3 ln 53- Col. 4 ln 40).

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify **Umemoto et al.** teachings by changing the linearly of the output signals by applying inverse trigonometric functions as taught as **Spellman** in

order to accomplish changes by mathematical functions and not by changing elements on the system saving manufacturing costs.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ARLEEN M. VAZQUEZ whose telephone number is (571)272-2619. The examiner can normally be reached on Monday to Friday, 7am to 4pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Q. Phan can be reached on 571-272-7924. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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